media. These were published in the *Proceedings* of the Royal Society, vol. xvii., 1869. A series of papers in the *Proceedings* of the Royal Society and in the *Journal of Anatomy* followed, giving the result of observations upon the circulation of the blood, conducted with great ingenuity by means of the sphygmograph, aided by various modifications and improvements upon the original instrument due to his inventive and mechanical skill. It is, indeed, probable that physiology is the subject to which he would most willingly have devoted his attention had not his energies been turned to the pursuit of morphology by his receiving the appointment, in January, 1872, of Prosector to the Zoological Society. This appointment is one which, perhaps more than any now existing, comes near to an ideal endowment of research. An unlimited amount of new material is placed in the hands of its occupant there are no duties beyond those of making and recording original observations, and ample facilities are given for the publication and illustration of all the observations made. To the efficient performance of the duties of this office Mr. Garrod applied himself with great energy and zeal, as testified by his numerous contributions upon the comparative anatomy of the vertebrate animals, which have enriched the publications of the Society, from the date of his appointment to the present time. He devoted great attention to the anatomy of birds, hitherto too much neglected, and his observations upon their myology and visceral anatomy were beginning to throw some light upon the very difficult and obscure subject of the mutual affinities of the members of this class. The curious and most unexpected variations in structure often revealed in the dissection of species thought to be closely allied, soon convinced him of the necessity of far more extended and minute observations than had previously been made, and those who closely watched his work and knew that besides the observations he had had time to complete and publish, he had already accumulated a vast mass of facts, partly in notes and drawings and partly in the stores of his memory, feel most keenly how much has been lost by his early death.

His eagerness in acquiring knowledge was only equalled by his activity in imparting it to others, and he had a remarkably easy and lucid method of explaining, even to an uninstructed audience, difficult problems of physiology or anatomy. With the black-board or some ingeniously contrived diagram or mechanical illustration, he was never at a loss to make his hearers comprehend his meaning. These great and varied powers probably tempted him to overtask his strength. Not content with his work at the Zoological Society, he sought for and obtained the Professorship of Zoology and Comparative Anatomy at King's College, in 1874, and the Fullerian Professorship of Physiology at the Royal Institution in 1876. He was also appointed one of the Examiners in the Natural Science Tripos at Cambridge in 1875, and was for several years a constant contributor to this journal. In 1876, when he had but just completed his thirtieth year, he was elected a Fellow of the Royal Society.

In the simple and single-hearted devotion to the sciences he cultivated, he was without a particle of jealousy or mistrust of others, but was always anxious to assist those who were working in the same direction, and his room at the Zoological Gardens was gradually becoming the profitable resort of many of the younger workers at comparative anatomy, who were encouraged in their labours by his advice and example.

Up to little more than a year ago he was apparently in the enjoyment of vigorous health, but symptoms of the insidious disease, phthisis, which terminated his existence, then for the first time showed themselves. Through the gradual decline of his powers, and amid considerable suffering, borne with the greatest patience and calmness, he continued to the last to spend all his remaining strength in making the knowledge which he had acquired available for the instruction of those that should come after him.

W. H. F.

JOHN MIERS, F.R.S.

THIS well-known botanist, whose death took place on the 17th inst., was born in London on August 25, 1789, of Yorkshire parents. After leaving school he devoted his time to the study of mineralogy and chemistry, in which latter science he made a series of important researches, but it was only subsequently during his long residence in South America that he acquired his taste for botanical knowledge, and by making dissections and drawings of plants he became a botanist. In 1825 he paid a short visit to England and then published his "Travels in Chili and La Plata." In Brazil, where he subsequently resided eight years engaged in his professional engineering labours, he made extensive collections of plants and insects. After his return to England he was elected a Fellow of the Linnean Society in 1839 and a Fellow of the Royal Society in 1843, acting for a time on the Council of both societies. He contributed many papers of interest to the Linnean Society, and published the "Illustrations" and the "Contributions" to South American Botany. He served on the jury of the Brazilian Section of the Exhibitions of 1862, and of 1867 of Paris, and for his labours the Emperor conferred on him the honour of Commander of the Order of the Rose. His zeal and energy in his pursuits were most untiring, and he only desisted from his labours when forced by failing health in July last, since which time he gradually became weaker, till death ended his life on the 17th inst. in the ninety-first year of his age. It is understood that Mr. Miers has left his botanical collections to the British Museum.

As a botanist, Mr. Miers was most painstaking and accurate in his investigation of details. His descriptions, and especially his original drawings, afford ample evidence of this. On the other hand, his estimate of the relative value of the details he elaborated with such zeal and care was often at fault. His observation was keen and accurate, but his judgment was less to be relied on. It is on this account, probably, that multitudes of species and, in lesser numbers, genera, and even orders, proposed by him, have not been generally accepted by his brother naturalists. Mr. Miers, we believe, never adopted evolutionary views, but remained a believer in the fixity of specific types. What, however, is more remarkable is that to the last he disbelieved in the action of the pollen and of the pollen tube in the formation of the embryo plant. In this particular Mr. Miers probably stood alone among his fellows.

But whatever difference of opinion may exist as to the value of his inferences, there can be none as to the laborious accuracy of his descriptions, the fidelity and beauty of his drawings (too often spoiled in the reproduction), and the generous kindliness of the man.

NOTES

M. RAOUL PICTET has been appointed Professor of Physics by the Council of State of Geneva, at the University of his native city.

M. KRANTZ, the director of the Paris Exhibition of 1878, is publishing the lectures delivered at the Trocadero. It will consist of no less than thirty-five thick 8vo volumes, five of which have already gone through the press.

AT the meeting on October 7 of the Manchester Literary and Philosophical Society, the president, Dr. Joule, described a simple means for checking the oscillations of a telescope. It consisted of a leaden ring placed centrally about the axis of the

tube of the telescope and attached thereto by three or more elastic caoutchouc bands. He had employed two of these rings for his telescope, one placed near the object-glass, the other near the eye-piece. Their united weights were only one-quarter of that of the telescope tube, but nevertheless they diminished the time required for the cessation of vibration to one-sixth of what it was before their application.

IT is curious to see the impression which the electric light has made on two semi-civilised monarchs, the recent barbarities of one of whom at least have proved him to be little better than a savage. The King of Burmah, the papers tell us, has recently ordered a wholesale importation of electric lighting apparatus; and from a note in the last number of *Les Mondes* we learn that the Shah of Persia has had the light introduced into Teheran, showing an intelligent interest in its working under the direction of a Frenchman, M. Fabius Boital. So pleased was his Persian Majesty with the display that, *Les Mondes* states, he "decided on the creation of a palace of industry, the construction of which he has confided to M. Boital." Let us hope that the Shah will continue in this laudable frame of mind, and be led on to introduce many of the other beneficial applications of science into his ill-governed country.

MR. FRANCIS GALTON has reprinted, with some additions, an abstract of his Royal Institution lecture on Generic Images. Appended are some interesting autotype illustrations showing the result of composite likenesses of Alexander the Great and Napoleon I., and the composite result of likenesses of six Roman ladies and of eighteen criminals.

MR. R. IRWIN LYNCH, late of the Royal Gardens, Kew, has been appointed Curator of the Cambridge Botanic Garden, in place of the late Mr. Mudd.

THE following scientific missions have been authorised by the French Government for this year:—Ernst Chartre, of the Lyons Museum, is to carry out anthropological investigations in Kasan, the Caucasus, the Crimea, and Turkey; Emil Rivière, prehistoric researches in the department of Alpes Maritimes; and Paul Sárda to investigate the geology of the soil of Japan, and visit the most important mining districts.

DR. KARL RÜSS, the well-known ornithologist, has, in his serial *Isis*, issued a request to all sportsmen in Germany to abstain during the present shooting season from killing hares and partridges, as he opines that in many places both kinds of game would be completely exterminated if his warning is not heeded. Sportsmen in this country would perhaps also do well to give the subject some consideration, as there is no doubt that the two species named must have suffered considerably from the unfavourable weather which prevailed during the last spring and summer.

EARTHQUAKES are reported from Klagenfurt and Grafenstein in Carinthia. At the former place a violent shock was felt on the 1st inst. at 2h. 20m. 25s. A.M. The phenomenon lasted for 2–3 seconds, and was accompanied by loud subterranean rumbling. The direction in which it proceeded was north-north-east to south-south-west. At the latter place a shock was felt on the 1st inst. at 2h. 5m. P.M., also accompanied by a rumbling noise; direction, west to east. In the Chinese provinces of Shen-Si and Kan-Su earthquakes have quite recently caused much damaged. It would seem that the earthquake which occurred on Friday and Saturday, the 10th and 11th inst., extended over a far wider area than had at first been reported. Shocks of greater or less violence were felt not only all over Eastern Hungary, but throughout Transylvania, Servia, Roumania, and even Bessarabia. The phenomenon manifested itself in Belgrade at half-past four in the afternoon of the 10th, and lasted eight seconds, the direction of the motion being north-north-east and south-south-west. In Weisskirchen there were two violent shocks felt on Friday afternoon about a quarter before five o'clock. Further shocks were experienced at half-past seven, and again on Saturday morning at a quarter to five, and all through the night slighter quakings and oscillations of the earth were constantly being repeated. A large number of chimneys were thrown down, and a number of houses were cracked and otherwise damaged at this place. From Temesvar it is reported that a number of shocks, one rapidly succeeding the other, were felt, the ground oscillating under foot. The shocks in Karansebes were so violent as to dash plates and dishes from their shelves to the ground, while to people in the street the ground appeared to rock with an unsteady motion like that of a vessel on a rough sea.

WE have more than once remarked on the extreme incompleteness of the indices to that most valuable journal, the *Quarterly Journal of Microscopical Science*. The index to the new volume (xix.) is not even as complete as the table of contents. It is in the interest of both zoology and botany that we make these remarks.

M. EDOUARD SARASIN has recently established a registering limnimeter, similar to those of MM. F. A. Forel and Th. Plantamour at Geneva, in a locality close to Vevey, near the eastern extremity of the Lake of Geneva. Several observations which he has made since the establishment of the instrument fully confirm the results of the investigations of Forel on the state of permanent oscillation of the fluid mass. The times of maxima and minima of the height of the water coincide with those which are observed at Geneva, showing their predicted alternation, and following an analogous period of seventy-eight minutes.

THE establishment of the electric light at the British Museum appears to have been successful. Eleven lights in all have been fitted up, and of these four are placed in the reading-room, four in other parts of the building, and three outside it. The four in the reading-room are placed, one in the centre and three equidistantly around it. They are supplied with continuous currents, each from its own Siemens dynamo-electric machine. Of the lights in other parts of the Museum, two are placed in the entrance-hall, one in the reading-room corridor, and one in the Greek gallery. In the courtyard in front of the building are two more lights, while another is placed in the rear, near to the engine and machine-house. These seven lights are supplied from one Siemens machine, producing an alternating or divided current. It will thus be seen that two different systems of electric lighting are employed, both, however, being on the Siemens principle—the four lights in the reading-room being produced by continuous currents, and calculated to be each equal to 4,000 candles, the seven other lights, which are estimated at 400 candles each, being produced by an alternating current, and being connected in one circuit about 1,200 yards in length.

THE Indian Museum will be finally closed to the public on Saturday.

THE laying of the new cable from Marseilles to Oran, in Algeria, has been attended with several mischances. The operation has been executed in a singular manner. The *Dacia* laid down the land cable from Algiers and steamed to Marseilles, in order to begin the operation from France. The end of the land cable had been buoyed, but when the *Dacia* tried to pick it up to connect it with the end coming from France, it broke. The *Dacia* and *Charente* tried to recover it with grapnels, but up to the present time without any other result than deteriorating the existing cable, which is now out of use; so that instead of having two cables, the capital of Algeria has none. All the messages were sent by the Bone line, which is encumbered by work, being mostly devoted to messages from

Tunis and Tripoli. We believe the cable has at last been successfully laid.

IN the note in NATURE, vol. xx. p. 563, on the elevations attained by railways, mention is omitted, Mr. D. Sharp writes us, of the Spanish lines which are so remarkable in this respect. The northern line is at the sea-level at San Sebastian, but attains a height of 614 metres, between Zumairaga and Alsasua; after descending from this, an elevation of 934 metres is reached, between Briviesca and Burgos; and after a long transit, 1,359·88 metres (4,476 feet) is touched by the railway while traversing the Guadairama about thirty miles from Madrid. The line from Santander to Alar del Rey reaches an elevation of 984 metres in passing the Cantabrican chain near Reinosa, and in the distance of 33 kilometres between Barcena and Reinosa, mounts 560 metres. The southern line from Madrid to Cordova does not reach such great elevations as the North Spanish lines; nevertheless, in passing the Sierra Moreno, it attains the considerable altitude of 798 metres, or 2,630 English feet above the sea-level.

IT is stated that the heavy rains in Assam have flooded part s of the country and threaten serious damage to tea prospects. Some of the gardens are reported to be looking very unhealthy and yellow.

HER MAJESTY'S Consul at Panama reports that india-rubber has almost ceased to be an article of export from the isthmus, mainly in consequence of the great difficulty and expense of getting at the trees in the remote districts of the interior. Those nearer the coast have been destroyed by the wasteful system pursued by the natives in cutting down the trees to procure the sap.

THE German Society for Cultivation and Acclimatisation of Birds will hold its fifth exhibition at Berlin on November 21–25 next. Cage-birds in the widest sense of the word, and park-birds generally will form the principal objects of the exhibition, which will also include stuffed specimens, skeletons, skins, nests, and eggs, as well as all apparatus and paraphernalia applying to the object of the Society. Those of our readers interested in ornithology who wish for further particulars should apply to Herr H. Schmidt, 32, Lothringer-Strasse, Berlin, N.

AT Pritschaberg, near Nassenfus in Lower Carniola more than 4,000 Roman copper coins have recently been found. Most of them were contained in an earthen jar and many others surrounded this; the whole was imbedded in the ground close to a road and at a depth of only half a metre. The coins are tolerably well preserved and date from the reign of the Emperors Severus (A.D. 193 to 211), Gallienus (254 to 268), Claudius (268 to 270), Aurelianus (270 to 275), Tacitus (275 to 276), and Probus (276 to 282). The greatest number date from the reigns of Aurelianus and Probus. The jar and coins were evidently buried during the reign of the latter, as not one coin dating from the reign of his successor Diocletian is amongst the number.

IN a recent paper to the Berlin Academy, on Progress in Knowledge of the Chemical Nature of Meteorites, Prof. Rammelsberg states that since he wrote in 1870 a paper on the Chemical Nature of Meteorites, more than twenty meteoric irons and about as many chondrites have been obtained and examined, besides some meteorites belonging to the more rare species; and he therefore thinks it desirable to make a fresh survey of the subject. He adopts Prof. Rose's classification. Among other points noticed are the discussions relating to the iron masses of Ovifak. The presence of nickel can no longer be regarded as a sure sign of the meteoric nature of iron masses. The small group of pallasites has been increased by one new member, the bronzite-pallasite of Rittersgrün (found in 1833 and recognised as a meteorite since 1861, but its true nature only determined lately by Weisbach and Cl. Winkler). Specially interesting is the occurrence of a white mineral (asmanite) consisting entirely of silicic acid, found in the Rittersgrün meteorite, as also in that of Breitenbach. A second representative of the rare meteorites which are free from metallic iron has been found in the Ibbenbühren stone (which contains Fe.3Mg). The first was the stone of Manegaum, purely bronzite. Recent researches on meteoric iron do not elucidate certain chemical differences of physically distinguishable parts, to which the earlier works of Reichenbach and Meunier referred; nor is the nature of the crystalline combination schreibersite more exactly known. (For further details we must refer to the *Monatsbericht*.)

THROUGH a recent landslip at the Salzberg, Hallstadt, a wooden structure was laid bare, in excavation of which were found a number of bones and tools, which appear to have belonged to the period of Celtic interments at the Salzberg. Among these objects was an implement (of unrecognisable nature) with a thick blue coating, which, on examination by Herr von Hochstetter, was found to be covellin or protosulphide of copper, the interior being copper. The coat was 0·5 to 1 ctm. thick, and showed a composition of 32·81 per cent. sulphur, and 64·45 per cent. copper. Its specific gravity was 4·611. The copper below presented a much-corroded surface, and in the hollows were spherules of arragonite about 2 mm. in diameter. The conditions of eating away of the copper and complete transformation of it into protosulphide of copper were furnished (says the author) in the burial-ground containing gypsum and greatly permeated with decaying animal and vegetable remains. From the gypsum and organic remains there would be formed abundant sulphide of calcium, which would cause transformation of the copper according to the formula—

$$Cu + SCa + CO_2 + O = SCu + CO_3Ca,$$

or $$Cu + SCa + (CO_2)_2\,CaO + O = SCu + 2CO_3Ca.$$

WE receive from America details of the accident which terminated for this year the career of the New York captive balloon on August 16, the very day when the Paris captive balloon was torn to pieces by the wind because it had not gas enough to sustain its spherical form. The New York balloon was sent up with two persons only as a trial, and rose to 800 feet when it burst. The two passengers were precipitated to the ground, but no harm was done to them, the balloon having acted the part of a parachute. The bursting was inevitable, the balloon having been started full of gas and the neck having been fastened with a rope. The rent extended from the top to the equator.

THE *Times* Paris correspondent states that at Guisseny, Finistère, a cave 15 metres long by 4 wide has been discovered under a heap of rocks. One entrance faces the sea at a height of 4 metres, and the other the land, so that it must have been well adapted for watch and defence. Below a layer of ashes were found stones laid together, human bones, remains of funeral urns, evidently Celtic, a considerable quantity of animal bones, some of them apparently of extinct species, and a stone hammer and polished porphyry hatchet.

WE have received a pamphlet of fifteen pages entitled "Notes on the Flora of Hampshire," by F. Townsend, M.A., F.L.S. This consists principally of two carefully drawn-up lists or tables of plants. The first list comprises plants found on the Hants mainland but absent in the Isle of Wight or in one or more of the adjacent counties of Wilts, Dorset, Sussex, Surrey, or Berks. The second list is that of plants absent on the mainland in Hants but found in one or more of the counties referred to above. By the first of these lists Mr. Townsend points out "that of the seven floras enumerated those of Surrey and of Sussex more nearly

approach that of Hants, the former possessing 176, the latter 174 of the 242 species found in Hants mainland but absent in one or more of the adjacent floras; the maritime or coast plants being deducted, in order to compare a county not possessing a coast with one possessing such." Regarding the second list the author says:—"We should naturally suppose . . . the floras of Surrey and Sussex would again be shown to approach the flora of Hants mainland by thus possessing fewer species not found in the latter, and that the floras of Wilts, Berks, and Wight (which by the first list are shown to be most dissimilar from Hants mainland, for Wilts possesses 121, Berks 109, and Wight only 96 of the 242 species in List No. 1) would possess many more species not found on Hants mainland than would Surrey or Sussex; but the reverse is the truth, for these two last named counties are shown by List 2 to possess more species not found on Hants mainland than Wilts, Berks, Wight, or Dorset possess." The author advances an explanation for this apparent contradiction and concludes his "Notes" with "a few words on River Basin Districts," explaining why he "would choose them for showing the geographical distribution of plants in preference to civil or artificial divisions." The value of such notes as these is by no means slight; those before us, we are told by the author, have been published principally in the hope that they may be seen by competent botanists who may have it in their power to communicate additional species or perchance point out errors so that their insertion may be prevented in the flora of Hampshire, which Mr. Townsend hopes soon to publish.

THE additions to the Zoological Society's Gardens during the past week include two Rhesus Monkeys (*Macacus erythræus*) from India, presented respectively by Dr. Douglas and Mr. R. C. Bonsfield; a Macaque Monkey (*Macacus cynomolgus*) from India, presented by Mr. T. Hobbs; a Bonnet Monkey (*Macacus radiatus*) from India, presented by Mrs. Bonamy Dobree; two Arabian Gazelles (*Gazella arabica*) from Arabia, presented by Capt. W. Bowden Smith, R.N.; a Great Bustard (*Otis tarda*) from Spain, presented by Mr. George G. Sandeman; two Chinese Tree Pies (*Dendrocitta sinensis*) from China, presented by Mr. Chas. Rice; a Common Waxbill (*Estrelda cinerea*) from West Africa, presented by Mr. J. C. Thorowgood; a Sun Bittern (*Eurypyga helias*) from South America, deposited; a Bosman's Potto (*Perodicticus potto*) from Sulymah, South-West Coast of Africa, two Crested Colins (*Eupyschortyx cristatus*) from Mexico, purchased.

THE SANITARY CONGRESS

THE Sanitary Science Congress opened its proceedings at Croydon on Tuesday under the presidency of Dr. B. W. Richardson, F.R.S., who spoke of the success which had attended the work of the Institute. In the evening a general meeting was held in the great public hall to hear the address of the president. As a sort of complement to his previous address in an ideal city, under the title of Hygeia, Dr. Richardson this year, under the title of Salutland, sketched an ideal land, polity, and people. He introduced his fancy sketch as follows:

"On the 19th of July of this year, at the home of the Father of modern Sanitary Progress, who has this moment resigned the chair to me, I met the most illustrious of now living men of science. Our conversation turned on many subjects, all of which were lighted up by the entrancing exposition which always gilds the genius of him to whom I specially refer, Prof. Owen. One subject peculiarly attracted the attention of us who listened to him as he expounded it. We had entered into a discussion on the question of the longevity and the natural duration of life of different classes of animals. With his usual scientific accuracy and industrious research, Owen had on that day estimated, from various data he had collected, the natural term of life of the curious animal, the hippopotamus. He had learned that its term of life was thirty years. He explained to us the mode by which he had arrived at that fact: how into the calculation it had been necesssary to take into account the dentition of the animal; the stages of development; the natural wearing out of the teeth; the period of gestation; the development of the skeleton into the perfection of a bony fabric, with particular reference to the combination of the epiphyses or loose ends of the bones to the shafts of the bones; and, lastly, the pathological or diseased condition of the dead animal of the species that had arrived at its full longevity, in order to determine whether or not there was evidence of cause of death from disease of some particular organ, or whether there was no such evidence, but simply a history of general decay from old age pure and simple.

"We were told that in a hippopotamus which had recently died, and which was known to have just turned thirty years of age, the two sets of teeth had fulfilled their allotted duty; that the bones of the skeleton were duly consolidated; and, that the organs of the body were equally degenerated; so that death had occurred, not from failure of any particular organ, but from failure of the organic parts altogether. In a sentence, the animal had died a natural death, and the constant of the term of life of it and its family was set down at thirty years, a constant to which all the facts that could be collated in respect to this species of animal definitely pointed.

"From this line of facts in respect to one type of animal life we were led to others, and the rule, laid down by the distinguished Flourens, by which the determination of natural old age is calculated on the basis of perfected maturity, was brought under review. The skeleton is perfected when the epiphyses or loose terminal parts of long bones are firmly united with the shaft of the bone. When the date of such perfection of development is known in the mammalian class of animals, the simple process of multiplying the age at that date by five, gives the natural anatomical life of the animal. The elephant came before us as an example. A young elephant, whose history has been related in the *Philosophical Transactions*, died at the age of thirty years. At that age the epiphyses of its bones were not completely united with the shafts. It was nearly but not quite matured. Multiply thirty by five, and one hundred and fifty years stand as the natural estimate of the life of the elephant, so that really an elephant might exist which had itself carried all the Governors-General of our Indian Empire. Moving from this animal of long life, we turned to the camel, to find full maturity at eight years, full life at forty. We turned to the horse, to find full maturity at five years, full life at twenty-five. We turned to the lion and the ox, to find full maturity at four years, full life at twenty. We turned to the dog to find, full maturity at two years of age, full life at ten. We turned to the cat, to find full maturity at eighteen months, full life at seven and a half years. We turned to the rabbit, to find full maturity at one year, full life at five.

"From these contemplations our minds very naturally reverted to the animal, man, to the members of the human family. Man, we learned, follows the same rule as the rest of living beings. Judged by the same test, his full maturity and full age may be calculated with equal precision. His maturity,—perhaps not quite the full maturity,—is twenty years. His full age, therefore, is one hundred years. This is the anatomical estimate of human life, the surest and by far the best of all that can be supplied, since it defines a law irrespective of and overriding all those accidental circumstances of social and physical storm and strife, which may interfere, and indeed do interfere, with every estimate based on the career of life itself, as it is shown in the ephemera by and through whom it is phenomenally demonstrated.

"This lesson, told with singular felicity of language from two masters of science,—for Owen never forgot Flourens,—struck Mr. Chadwick and myself with singular force. On a surer basis than we ever trod, it corroborated a view we had ourselves promulgated from entirely different stand-points; and it further corroborated a similar view which had been advanced by our eminent friend, Dr. William Farr. We were led, in a word, once again, to the inevitable conclusion that man, even in this stage of his probation on the planet, is naturally destined to walk upon it, endowed with sensibilities of life and intelligence, for a period of one hundred years, and that until he realises this destiny practically, he is in value of physical life actually degraded far below his earth-mates, whom he designates the brute creation, and over whom he presumes to exercise his, to